ILLUSTRATING THE MATHEMATICS STANDARDS

The following examples of student work illustrate achievement at the mathematics standards for years 3 and 4.

Rugby Scores

The task used in this illustration was part of a whole-school integrated studies unit to build on student interest in the Rugby World Cup 2011. It was adapted from Figure It Out, *Number Sense and Algebraic Thinking*: Book One, Levels 2–3, pages 6–7.

The task relates to achievement objectives for Number and Algebra from the mathematics and statistics learning area in *The New Zealand Curriculum.*

Rugby Scores

Discuss with your students the scoring system used in rugby to make sure that they understand it: 5 points for a try, 2 for a conversion (that is, 7 for a converted try), and 3 for a penalty or a drop goal.

The Aroha Primary School rugby team won their last game 28–5. Find at least two scoring combinations that could have given them their 28 points.

Some features of students' work used to make judgments in relation to the mathematics standards are described below.

ILLUSTRATING THE MATHEMATICS STANDARD

Rugby Scores

New Zealand Curriculum: Level 2	*Mathematics Standard: After three years at school*
In solving problems and modelling situations, students will:	
Number and Algebra • *use simple additive strategies with whole numbers … (number strategies)* • *know the basic addition and subtraction facts (number knowledge)* • *communicate and interpret simple additive strategies, using words … and symbols (equations and expressions)*	*Number and Algebra* • *apply basic addition facts and knowledge of place value … to:* – *combine or partition whole numbers*

Joe recorded and described two ways to get 28 points.

Joe applied known facts to solve the problem.

Two tries is 2 fives, and that makes 10. Double 10 is 20; that's 4 tries. But I've still got 8 points to get.

5+5=10 10+10=20 4 trys

Another try is 5, and then I've got 3 points left. That's a penalty. Altogether, that's 5 tries and 1 penalty. That's 28 points.

20+5=25 1 try 25+3=28 penalty

Joe partitioned 15 into 10 and 5 to help him with the subtraction.

5+5+5=15 28-15 10 5

3 tries is 3 lots of 5, that's 5 + 5 + 5 = 15. 15 away from 28 is 13.

28-10=18 18-5=13 13 left

I know 6 + 7 = 13, so we could have a converted try for the 7 and 2 penalties for 6 points. That's 3 tries, 1 converted try, and 2 penalties for 28 points.

6+7=13 7 is converted try 3+3=6 2 penaltys

Joe checked that 15 + 7 + 6 = 28. He used partitioning and tidy numbers to add 15 + 7 and then added 6.

15+7 5 2 20+2 22 22+6=28

Discussion

This task provides some of the evidence needed to show that Joe is achieving at early level 2 of the curriculum and the year 3 standard in Number. He has demonstrated that he can apply basic addition facts. He also uses his knowledge of place value to partition and combine numbers. This suggests that he is working at the Early Additive stage of the Number Framework.

ILLUSTRATING THE MATHEMATICS STANDARD

Rugby Scores

New Zealand Curriculum: Level 2	***Mathematics Standard: By the end of year 4***
In solving problems and modelling situations, students will:	
Number and Algebra • *use simple additive strategies with whole numbers … (number strategies)* • *know the basic addition … facts (number knowledge)* • *communicate and interpret simple additive strategies, using words … and symbols (equations and expressions)*	*Number and Algebra* • *apply basic addition … facts, simple multiplication facts, and knowledge of place value … to:* – *combine or partition whole numbers*

Maisie described and recorded three ways to get 28 points.

They can have four tries converted. 7+7+7+7 = 28
7+7 = 14
14+14 = 28

Maisie used doubling to confirm that 7 + 7 + 7 + 7 = 28.

A converted try is 7 points. Double 7 is 14, and double 14 is 28.

Another way is 3 tries for 15 points, 1 converted try for 7 points, and 2 kicks or penalties for 6 more points. 15 + 7 + 6 = 28.

3 tries. 15 points 3x5 = 15.
One converted try is 7, and two kicks penalties
15+7 = ~~15+2+5~~ = 15+5+2 = 22.
22+6 = 28.

Maisie used partitioning and her knowledge of place value to add 15 + 7.

Two tries for 10 points 2x5 = 10
Six penalties is 18 points. 3x6 = 18
cause 2 penalties is 6 2x3 = 6.
6+6 = 12 and 6 more is 18.
18 + 10 = 28

Maisie used repeated addition (6 + 6 + 6) to solve a multiplication problem.

A penalty is 3 points, and there's 6 penalties. 2 penalties is 6, so 4 is 12, and 6 is 18.

Discussion

This task provides some of the evidence needed to show that Maisie is achieving at level 2 of the curriculum and the year 4 standard in Number. She has demonstrated that she can apply basic facts and knowledge of place value in order to solve a problem in a variety of ways. This task suggests that she is working at the Early Additive stage of the Number Framework.